

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

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**PCT**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)



Applicant's or agent's file reference FPC04027-PCT		<b>FOR FURTHER ACTION</b> See paragraph 2 below	
International application No. <b>PCT/KR2004/001969</b>	International filing date (day/month/year) <b>05 AUGUST 2004 (05.08.2004)</b>	Priority date(day/month/year) 05 AUGUST 2003 (05.08.2003)	
International Patent Classification (IPC) or both national classification and IPC <b>IPC7 H01M 4/86</b>			
Applicant <b>LG CHEM, LTD. et al</b>			

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea	Authorized officer KIM, Jun Hak
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WRITTEN OPINION OF THE  
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International application No.

PCT/KR2004/001969

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

a sequence listing  
 table(s) related to the sequence listing

b. format of material

in written format  
 in computer readable form

c. time of filing/furnishing

contained in the international application as filed.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority for the purposes of search.

3.  In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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PCT/KR2004/001969

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	_____	YES
	Claims	1-15	NO
Inventive step (IS)	Claims	_____	YES
	Claims	1-15	NO
Industrial applicability (IA)	Claims	1-15	YES
	Claims	_____	NO

2. Citations and explanations :

Citations

D1 : US 5415888 A(16 May 1995)

NOVELTY(N) and INVENTIVE STEP(IS)

1. D1 discloses a method of making membrane and electrode structure having excellent characteristics that is formed by bonding the electrode to the membrane by a printing process using an ink comprising catalytically active particles, a suspension medium comprising a hydrocarbon having an ether, epoxy or ketone linkage and an alcohol group, which is preferably non-solid at processing temperatures, medium preferably being 1-methoxy 2-propanol ("MOP") and binders such as perfluorinated sulfonyl fluoride polymer, preferably 0-25% by weight, such polymer preferably being NAFION. RTM. perfluorinated sulfonyl fluoride polymer, preferably in a solution of hydrocarbon solvent, or perfluorinated sulfonic acid polymer, preferably 0-25% by weight, such polymer preferably being NAFION.RTM. perfluorinated sulfonic acid. The electrode ink is printed, coated or bonded onto the surface of the membrane. The electrode ink may optionally be pressed onto the surface of the membrane at elevated pressure and temperature.

The invention of claims 1-15 is a hybrid membrane-electrode assembly with minimal interfacial resistance and preparation method by using the catalytic ink. This feature does not differentiate the invention of the prior art D1. Therefore Claims 1-15 which do not include this feature are considered to lack novelty and inventive step.

INDUSTRIAL APPLICABILITY(IA)

The claims 1-15 is industrially applicable in using the electrode having a catalytically active layers for fuel cell industrial.